Mac Programming for iPhone Developers

Session 113

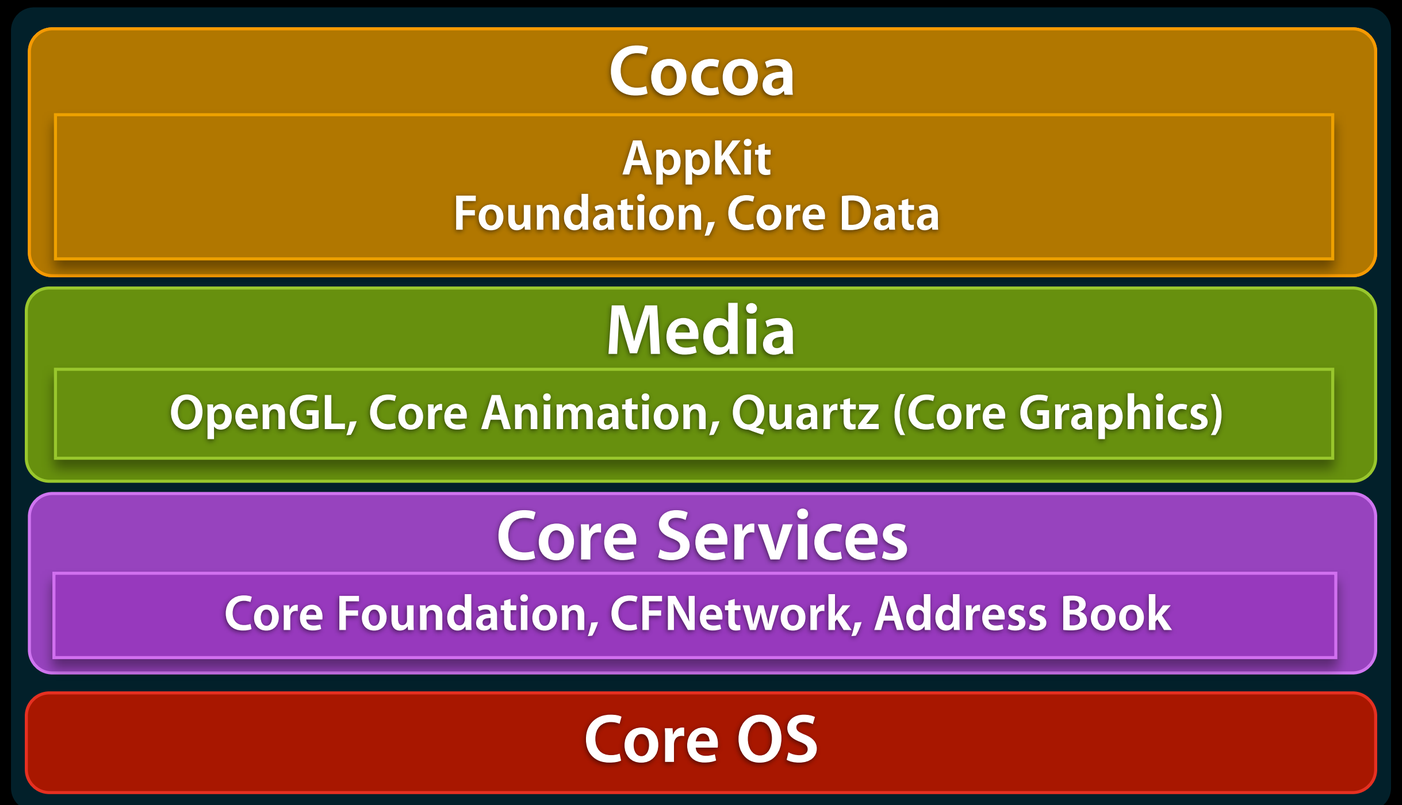
These are confidential sessions—please refrain from streaming, blogging, or taking pictures.

Mac Programming for iPhone Developers

Chris Parker
iPhone Frameworks Engineer

3G
9:42 AM
Messages
Tuesday
9
Calendar
Photos
Camera
YouTube
Stocks
280
Maps
73°
Weather
Voice Memos
Notes
Clock
Calculator
Settings
iTunes
App Store
Phone
Mail
Safari
iPod

Objective-C


Cocoa
AppKit
Foundation, Core Data
Media
OpenGL, Core Animation, Quartz (Core Graphics)
Core Services
Core Foundation, CFNetwork, Address Book
Core OS

Address Book

Security

Core Foundation

Foundation

CFNetwork

Core Data 3.0!

System Configuration

Audio Toolbox

Audio Unit

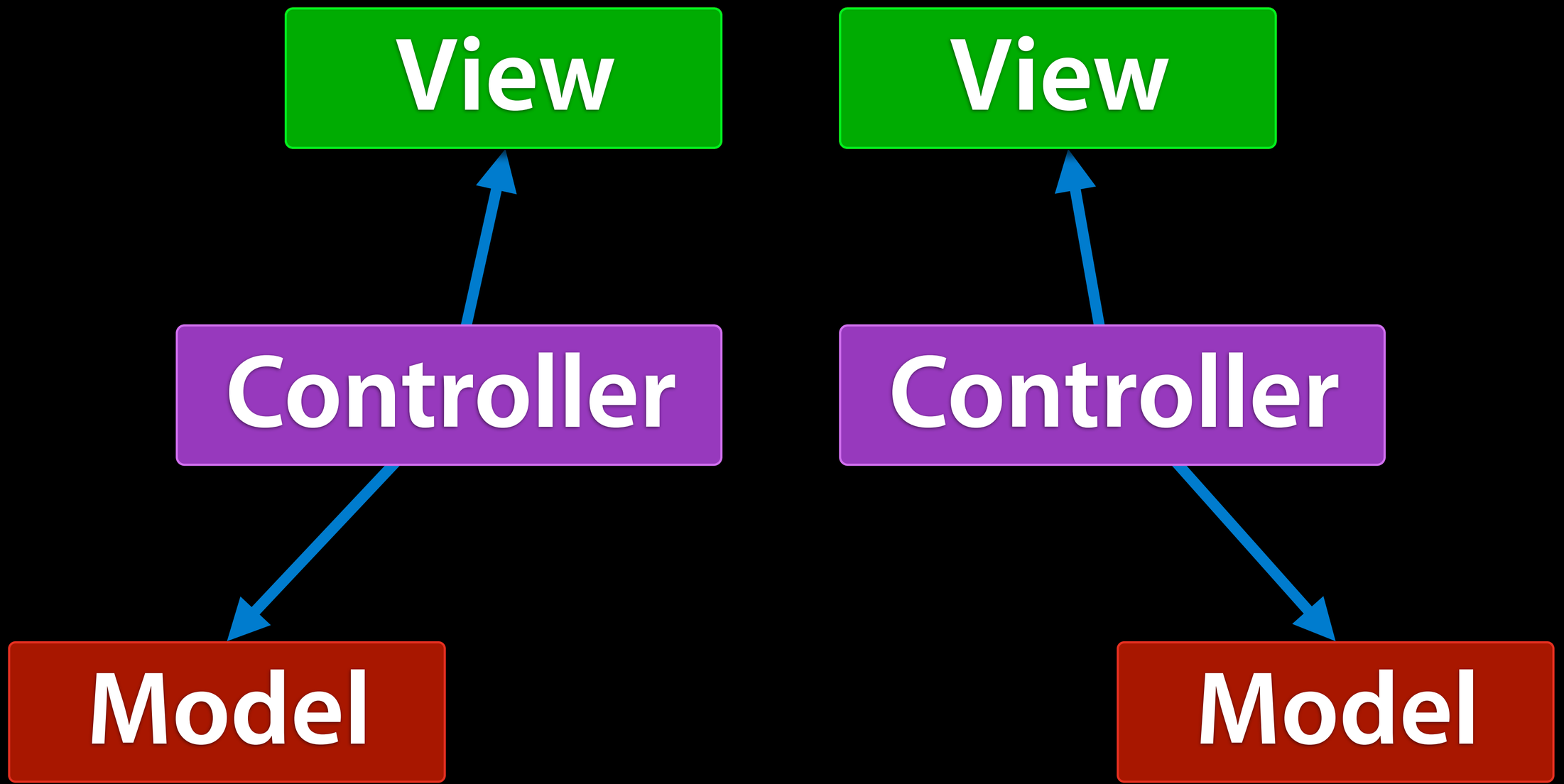
Core Audio

Quartz

10.6! Core Location

Mac Feature Availability

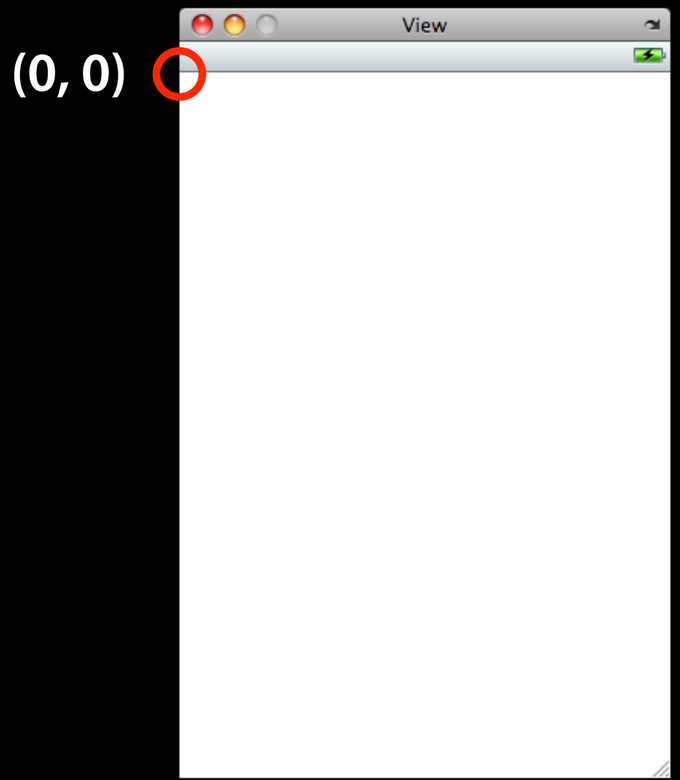
- Garbage collection
  - Retain, release, autorelease are no-ops
  - Memory is tracked by assignments
  - Collector thread cleans up unreferenced memory
- Blocks
  - ^{…}
- Availability macro guards for API
  - `#if NS_BLOCKS_AVAILABLE … #end`
  - `#if TARGET_OS_MAC && !TARGET_OS_IPHONE … #end`


View
View
Controller
Controller
Model
Model

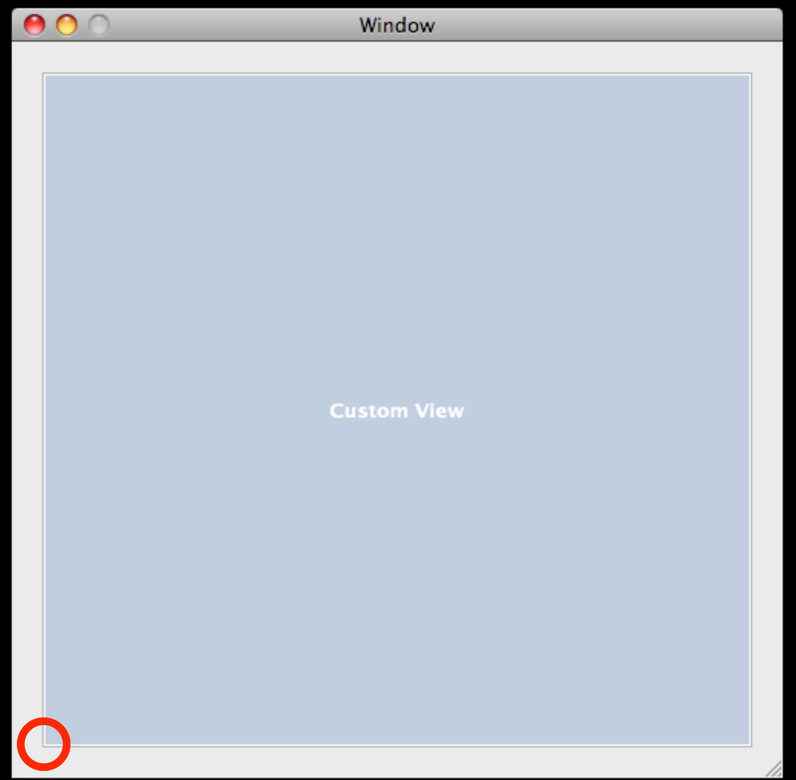
Views, Windows, and Events

UIView	NSView
Receives and handles events	
Responsible for drawing	
(0, 0) in upper left	(0, 0) in lower left
Always has layer	Opt-in to layers
Subviews can draw outside view bounds	Subviews clip to view bounds

UIView

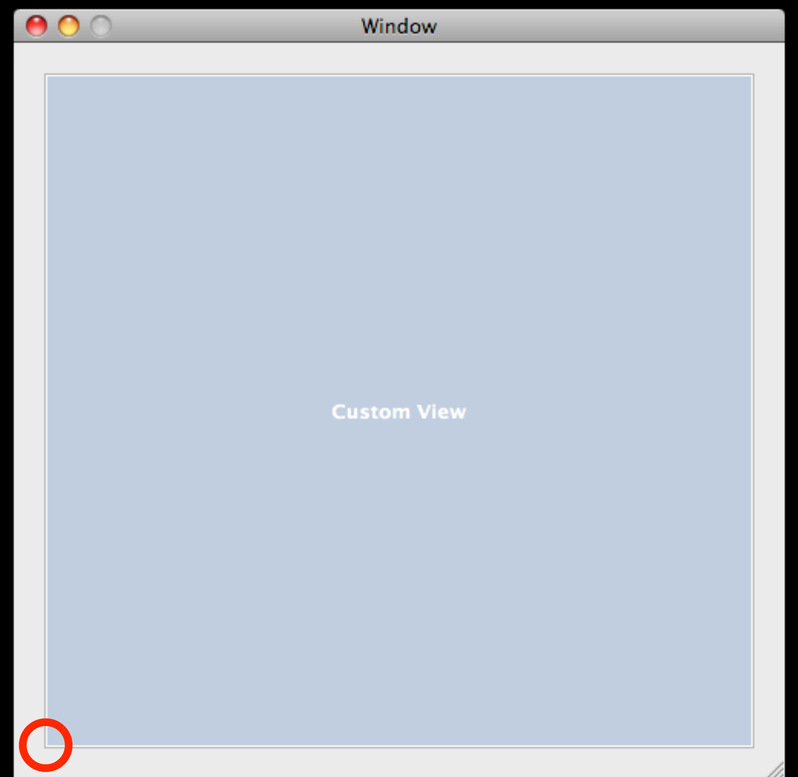


NSView



NSView

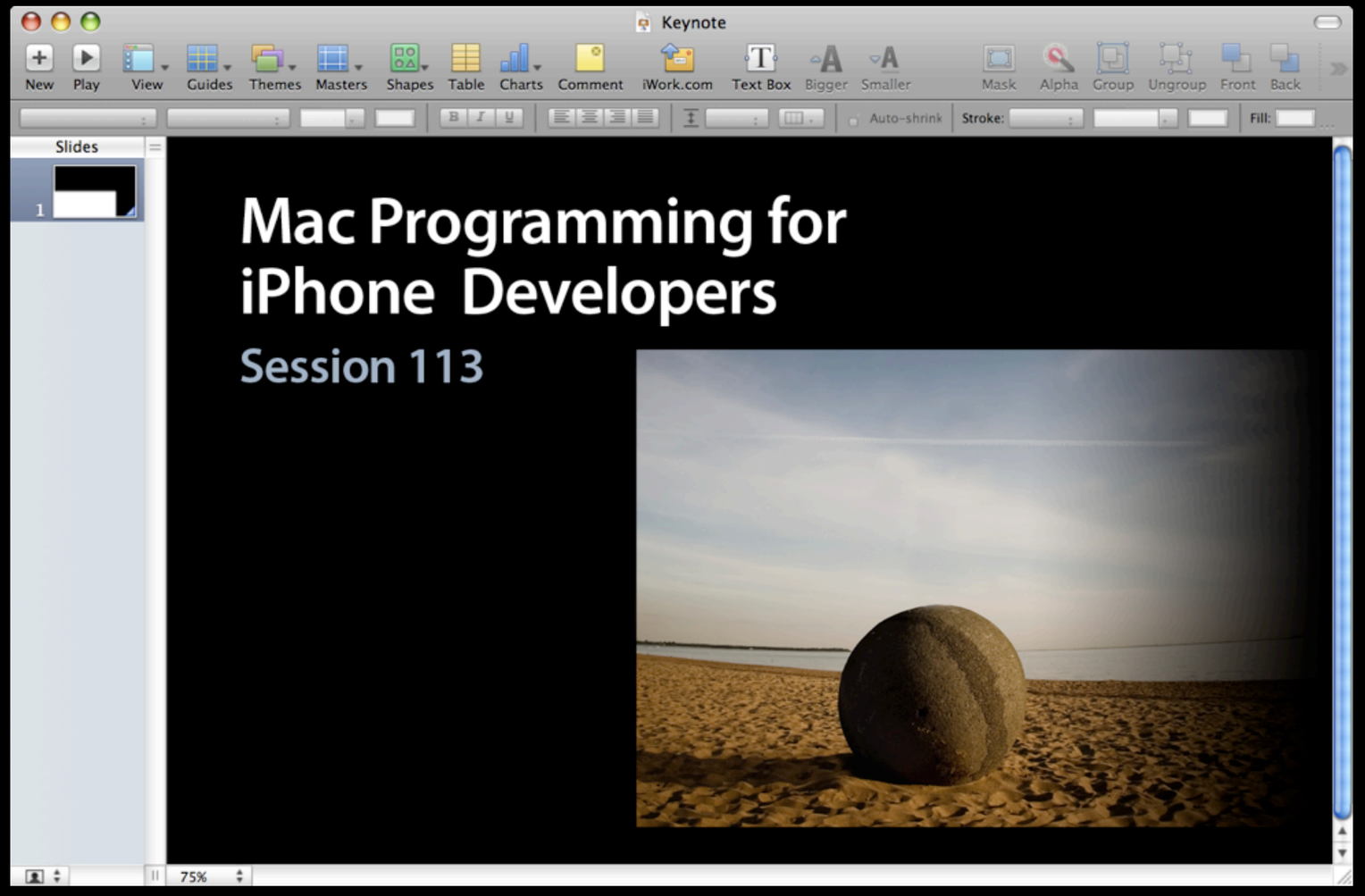
```
- (BOOL)isFlipped {
    return NO;
}
```



NSView

Flipped views

- Some views are flipped by default
  - NSButton
  - NSScrollView
  - NSSplitView
  - NSTabView
  - NSTableView
- Some views allow control or use the current context
  - NSImage
  - NSTextView, NSFont
  - NSClipView


Keynote
New
Play
View
Guides
Themes
Masters
Shapes
Table
Charts
Comment
iWork.com
Text Box
Bigger
Smaller
Mask
Alpha
Group
Ungroup
Front
Back
Auto-shrink
Stroke:
Fill:
Slides
1
Mac Programming for
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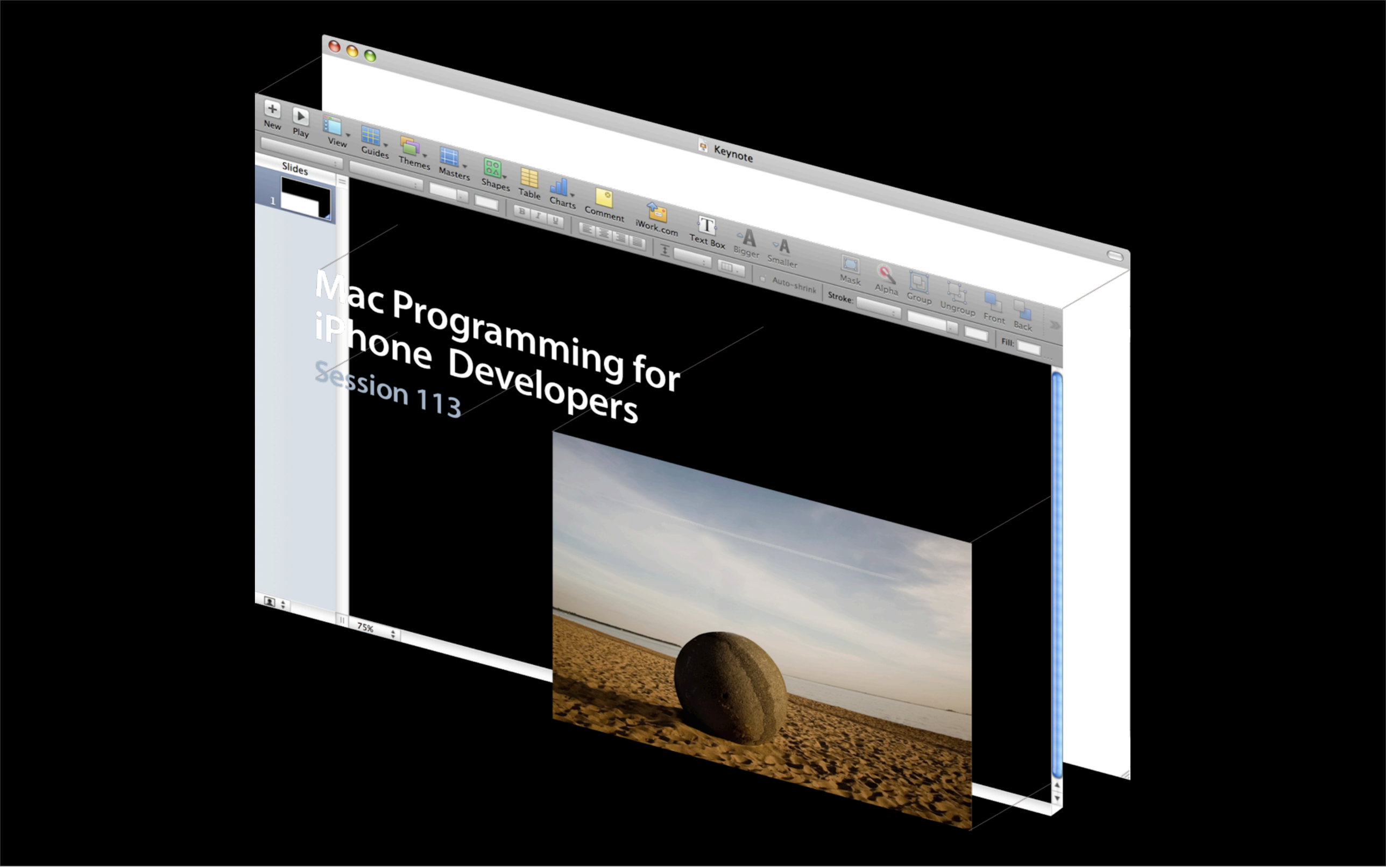
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iPhone Developers
Session 113
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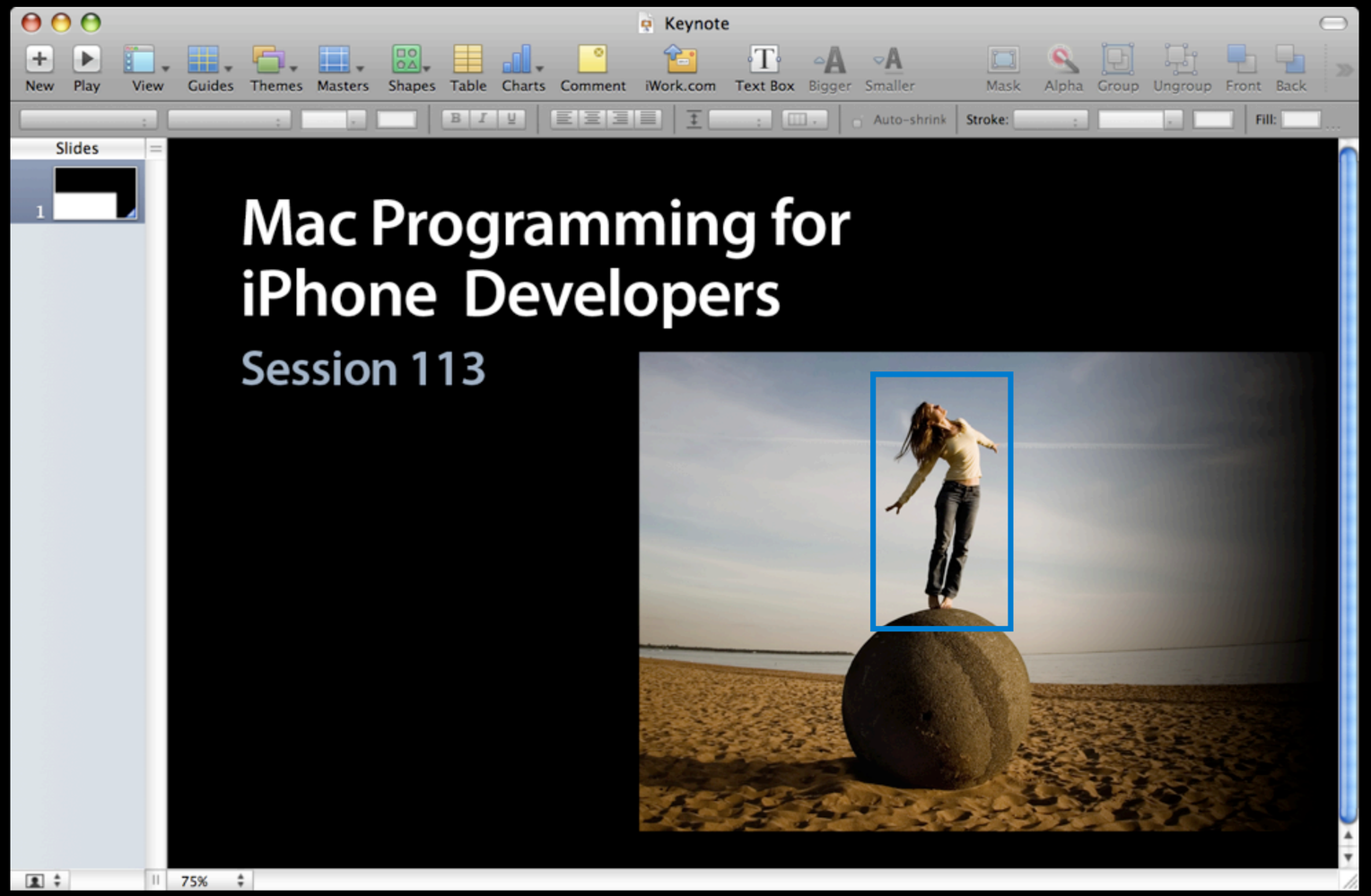
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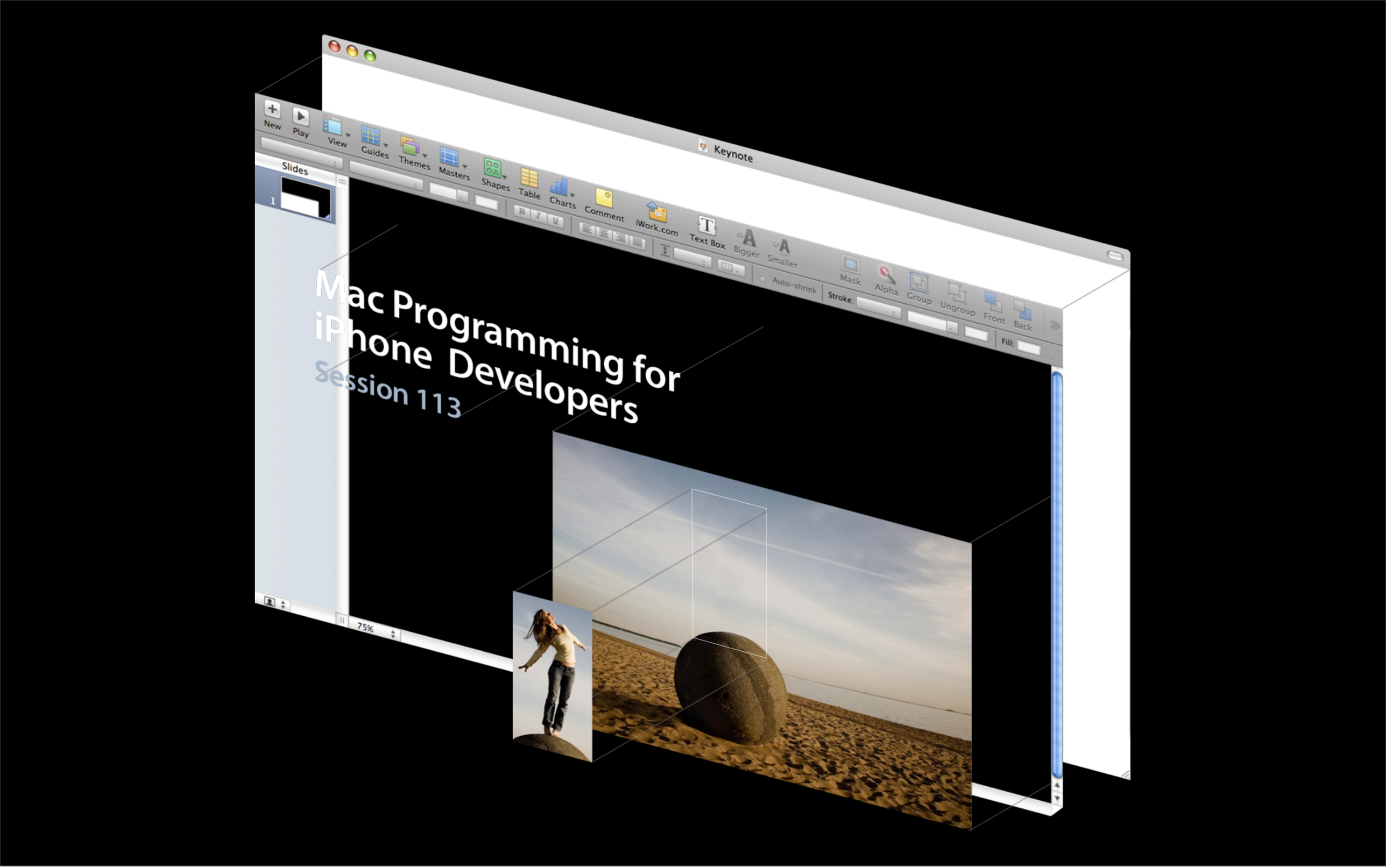
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Stroke:
Fill:
Slides
1
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Layer-Backed NSViews

```
- (void)setWantsLayer:(BOOL)flag;
```

- You must opt in
  - All subviews get layers
  - Invalidation is the same as UIView
- When to opt in?
  - Reduce redraw to make animation smoother
  - Need to use CAFilters
- When not to opt in?
  - Most of the time
  - Turn on, use, turn off

UIWindow	NSWindow
Container for views	
Inherits from UIView	Inherits from NSResponder
No user manipulation	User manipulates directly
Always screen-sized	Can be any size
One window	Many windows

UIEvent	NSEvent
Information about input actions	
Contains UITouch objects for sequence	Encapsulates many kinds of events
Persistent through sequence	New object per event
Touches can be cancelled	Mouse events cannot be cancelled

UITouch

NSTouch

Track information about touch events	
Integrated sensor	Opaque sensor
Touches are absolute	Touches are directed at view with mouse cursor

User Events in Cocoa

Nob Hill
Wednesday 3:30PM

Controls

UIControl	NSControl
Base class for controls	
Sends action(s) when directed	
Many actions, each has a target	One action with one target

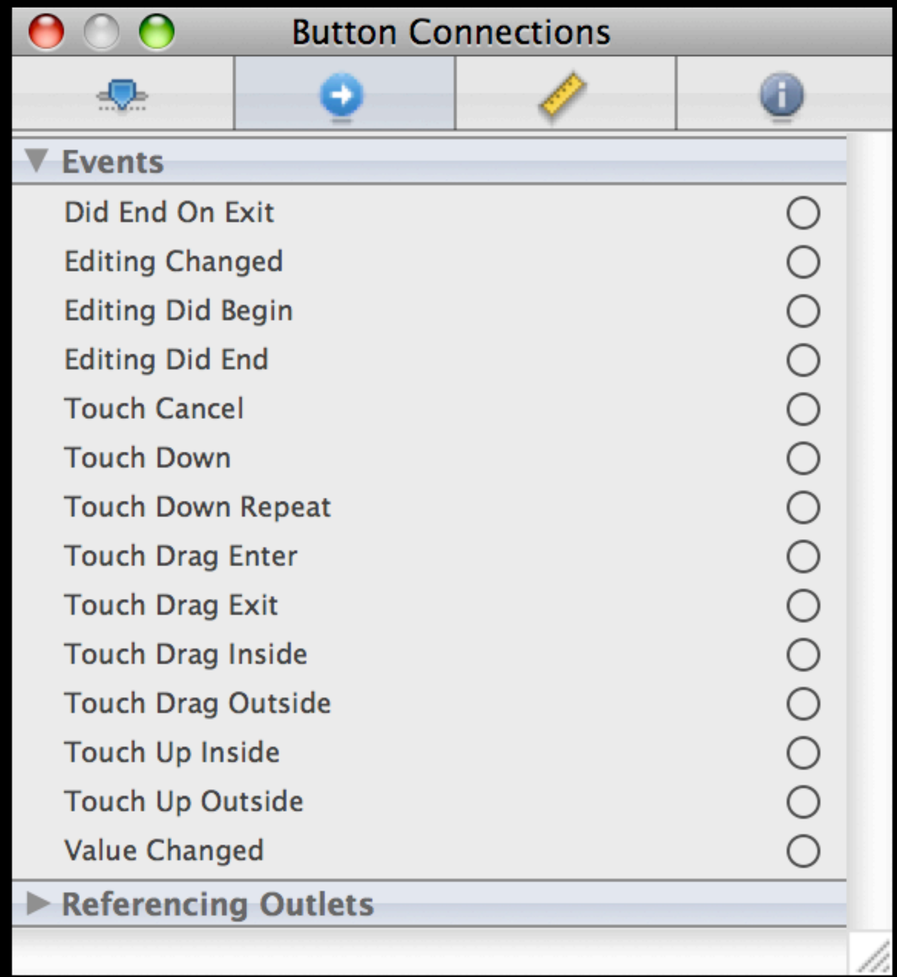
UIControl

Actions

```
- (void)action;
```

```
- (void)action:(id)sender;
```

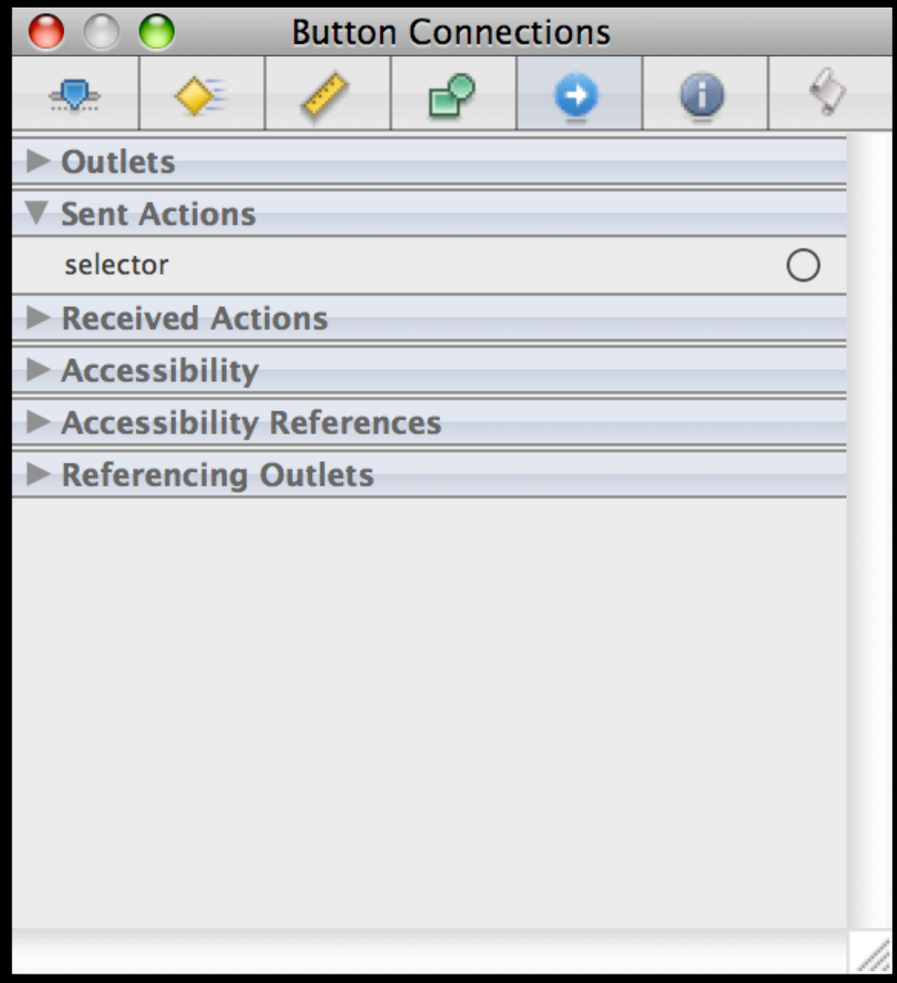
```
- (void)action:(id)sender
     forEvent:(UIEvent *)event;
```



NSControl

Actions

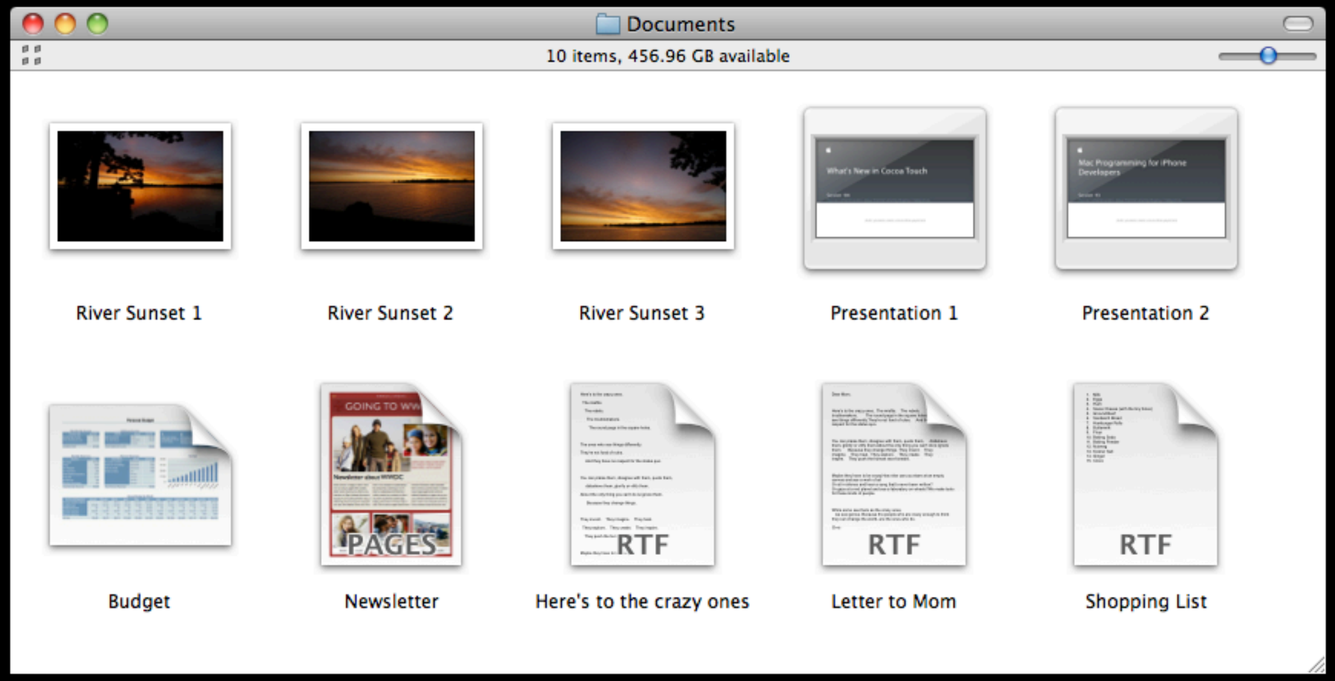
```
- (void)action:(id)sender;
```



Mac Applications

3G
9:42 AM
Groups
All Contacts
+
Search
A
John Appleseed
B
Kate Bell
H
Anna Haro
Daniel Higgins Jr.
T
David Taylor
Z
Hank M. Zakroff
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

3G
9:42 AM
All Contacts
Info
Edit
John Appleseed
mobile (888) 555-5512
home (888) 555-1212
ringtone Default
work John-Appleseed@mac.com
work 3494 Kuhl Avenue
Atlanta GA 30303
USA
home 1234 Laurel Street


Documents
10 items, 456.96 GB available
River Sunset 1
River Sunset 2
River Sunset 3
Presentation 1
Presentation 2
Budget
Newsletter
Here's to the crazy ones
Letter to Mom
Shopping List
PAGES
RTF
RTF
RTF

Document-Based Applications

NSDocument

- Reading and writing of data
- Atomic saves
- Simple scripting

Demo

Kevin Perry
Cocoa Frameworks Engineer

NSDocument

Reading your document

```
- (BOOL)readFromURL:(NSURL *)absoluteURL
             ofType:(NSString *)typeName
              error:(NSError **)outError;

- (BOOL)readFromFileWrapper:(NSFileWrapper *)fileWrapper
                     ofType:(NSString *)typeName
                      error:(NSError **)outError;

- (BOOL)readFromData:(NSData *)data
              ofType:(NSString *)typeName
               error:(NSError **)outError;
```

NSDocument

Writing your document

```
- (BOOL)writeToURL:(NSURL *)absoluteURL
            ofType:(NSString *)typeName
             error:(NSError **)outError;

- (NSFileWrapper *)fileWrapperOfType:(NSString *)typeName
                               error:(NSError **)outError;

- (NSData *)dataOfType:(NSString *)typeName
                 error:(NSError **)outError;
```

Demo

NSDocument

Other features

- Autosaving
- Printing
- Change management
- Error presentation

Drag and Drop

Intra- and Inter-application

Source

Operation

Destination

Drag and Drop

Operations

```
NSDragOperationNone = 0,
NSDragOperationCopy = 1,
NSDragOperationLink = 2,
NSDragOperationGeneric = 4,
NSDragOperationMove = 16,
NSDragOperationDelete = 32,
NSDragOperationEvery = NSUIntegerMax
```

Drag and Drop

Sources

```
- (NSDragOperation)draggingSourceOperationMaskForLocal:(BOOL)isLocal;
```

Drag and Drop

Destinations

```
- (NSDragOperation)draggingEntered:(id <NSDraggingInfo>)sender;
- (NSDragOperation)draggingUpdated:(id <NSDraggingInfo>)sender;
- (void)draggingExited:(id <NSDraggingInfo>)sender;

- (BOOL)prepareForDragOperation:(id <NSDraggingInfo>)sender;
- (BOOL)performDragOperation:(id <NSDraggingInfo>)sender;
- (void)concludeDragOperation:(id <NSDraggingInfo>)sender;
```

Table Views

UITableView	NSTableView
Has a delegate	
Has a data source	
Many rows, one column	Many rows, many columns
UITableViewCells for individual items	NSCells for individual items

A

John Appleseed

B

Kate Bell

H

Anna Haro

Daniel Higgins Jr.

S

Ziggy Stardust

...

```
- (NSInteger)numberOfSectionsInTableView:(UITableView *)tableView;
```

A

John Appleseed

B

Kate Bell

H

Anna Haro

Daniel Higgins Jr.

S

Ziggy Stardust

...

```
- (NSInteger)tableView:(UITableView *)tableView
 numberOfRowsInSection:(NSInteger)section;
```

John **Appleseed**

A

John Appleseed

B

Kate Bell

H

Anna Haro

Daniel Higgins Jr.

S

Ziggy Stardust

...

```
- (UITableViewCell *)tableView:(UITableView *)tableView
        cellForRowAtIndexPath:(NSIndexPath *)path;
```

Data Source	
Trés cher Restaurant Français	3
Taqueria	4
Tapas!	4
Fast Food Joint	2
Chow Mein To Go	3
Caffé Macs	5
Mom's	5

```
- (NSInteger)numberOfRowsInTableView:(NSTableView *)tableView;
```

Data Source	
Trés cher Restaurant Français	3
Taqueria	4
Tapas!	4
Fast Food Joint	2
Chow Mein To Go	3
Caffé Macs	5
Mom's	5

NSTextFieldCell

Data Source	
Trés cher Restaurant Français	3
Taqueria	4
Tapas!	4
Fast Food Joint	2
Chow Mein To Go	3
Caffé Macs	5
Mom’s	5

Trés cher Restaurant Français

```
- (id)tableView:(NSTableView *)tableView
objectValueForTableColumn:(NSTableColumn *)tableColumn
                      row:(NSInteger)row;
```

Data Source	
Trés cher Restaurant Français	3
Taqueria	4
Tapas!	4
Fast Food Joint	2
Chow Mein To Go	3
Caffé Macs	5
Mom’s	5

Mom's

```
- (id)tableView:(NSTableView *)tableView
objectValueForTableColumn:(NSTableColumn *)tableColumn
                      row:(NSInteger)row;
```

Data Source	
Trés cher Restaurant Français	3
Taqueria	4
Tapas!	4
Fast Food Joint	2
Chow Mein To Go	3
Caffé Macs	5
Mom's	5

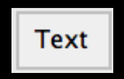
NSLevelIndicatorCell

Data Source	
Trés cher Restaurant Français	3
Taqueria	4
Tapas!	4
Fast Food Joint	2
Chow Mein To Go	3
Caffé Macs	5
Mom's	5

★★★★★

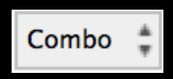
```
- (id)tableView:(NSTableView *)tableView
objectValueForTableColumn:(NSTableColumn *)tableColumn
                      row:(NSInteger)row;
```

Data Source	
Trés cher Restaurant Français	3
Taqueria	4
Tapas!	4
Fast Food Joint	2
Chow Mein To Go	3
Caffé Macs	5
Mom's	5



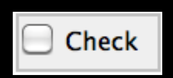
NSTextFieldCell

NSSliderCell



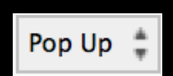
NSComboBoxCell

NSStepperCell



NSCheckBoxCell

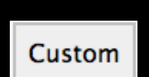
NSLevelIndicatorCell



NSPopUpButtonCell

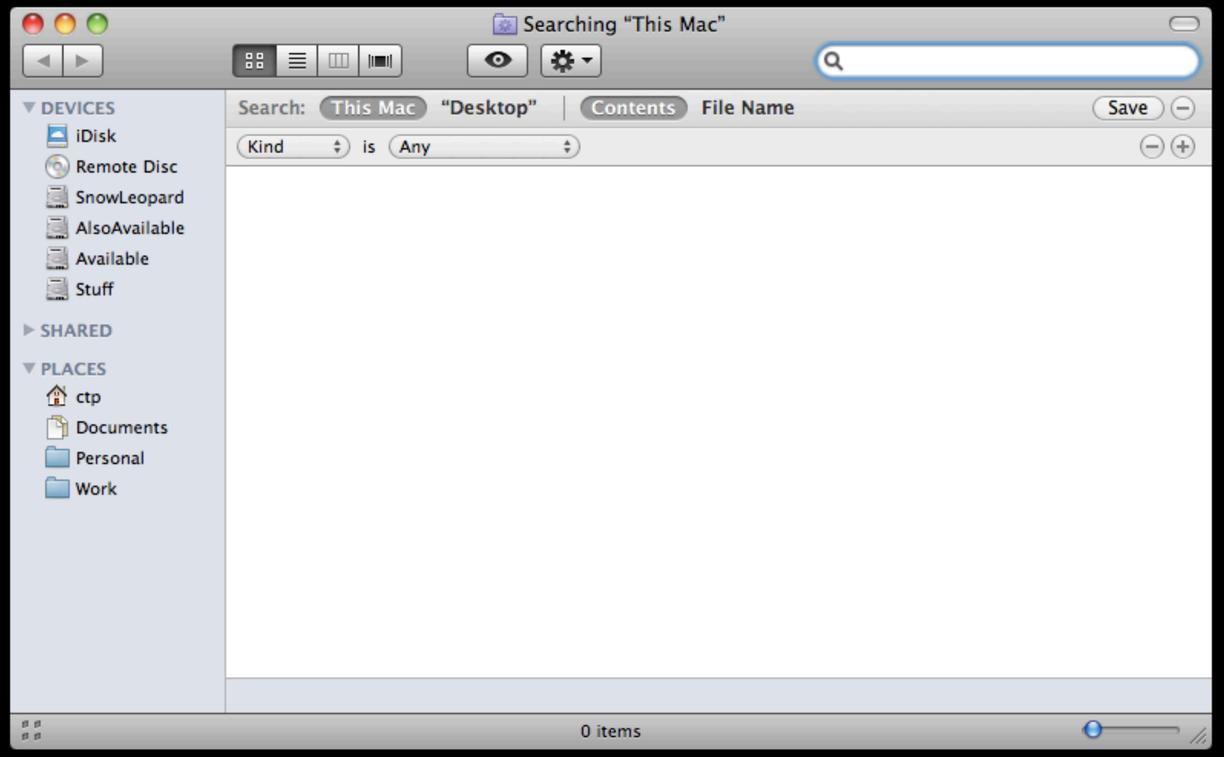
NSImageCell

NSSegmentedCell



Custom Cell

Demo


Searching "This Mac"
DEVICES
iDisk
Remote Disc
SnowLeopard
AlsoAvailable
Available
Stuff
SHARED
PLACES
ctp
Documents
Personal
Work
Search:
This Mac
"Desktop"
Contents
File Name
Save
Kind
is
Any
0 items

NSMetadataQuery and NSMetadataItem

Spotlight

- NSMetadataQuery
  - Predicate
  - Grouping
  - Asynchronous
  - Delegate
- NSMetadataItem
  - Not the file itself
  - Location, type, dates

Demo

Integrating with the Mac

Bonjour

Network service discovery

- Publish service on network
- Clients discover services

Keyed Archiving

NSKeyedArchiver and NSKeyedUnarchiver

- Compatible between Mac and iPhone
- Customization of objects
- Simple

Core Data

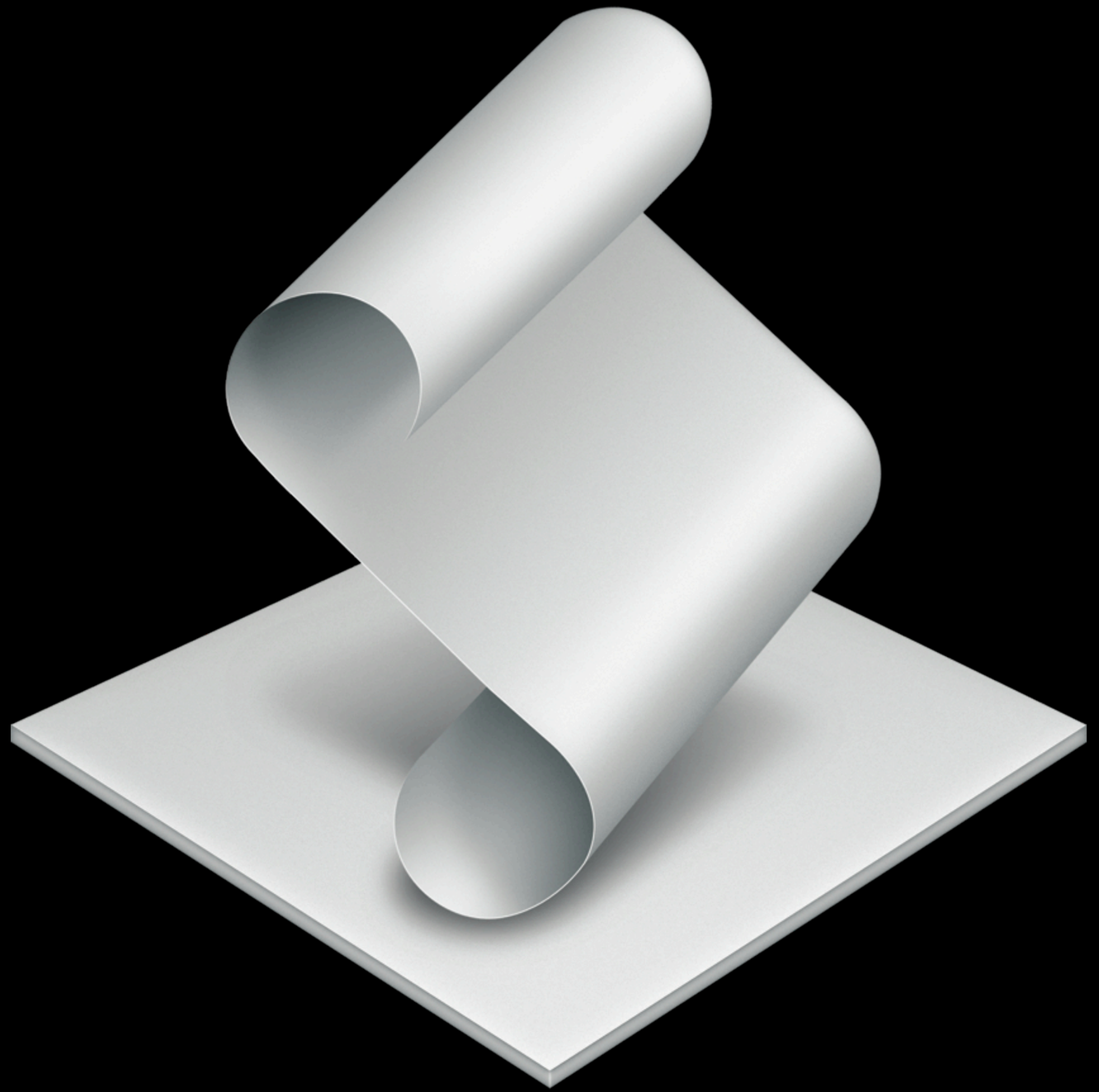
Object persistence management

- Manages entire object graphs
  - Entities
  - Relationships
- Versioning of data stores
- Efficient search using predicates

Introduction to Core Data on iPhone	Marina Tuesday 5:00PM
What's New in Core Data	North Beach Wednesday 10:30AM

Being a Great Mac Application

Market Share
The Hawaiian Backpacker's Guide
Italy 2005
EXTREME



Write Your Application!

More Information

Matt Drance
iPhone and Mac Application Frameworks Evangelist
mdrance@apple.com

Documentation
Mac Dev Center
http://developer.apple.com/mac/

Q&A

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WWDC09